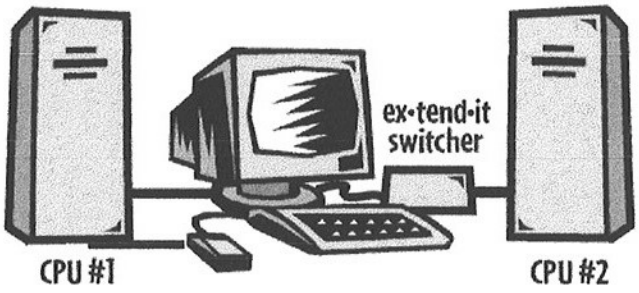
ex·tend·it
KVM SWITCHES

Professional Series

PC/MAC2000

USER MANUAL



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INTRODUCTION

Thank you for purchasing Gefen Systems' ex•tend•it PC/Mac2000 CPU switcher.The PC/Mac 2000 switches your monitor, keyboard, and mouse between up to six Macintosh, PC or SGI computers. It can be expanded with additional PC/Mac2000 units in cascade.The PC/Mac2000 unit is designed so you can place the computers up to 25 feet away from the location of the monitor, keyboard and mouse.

The ex•tend•it PC/Mac 2000 is a cross–platform hardware with a firmware solution for users who prefer to choose between using a Macintosh keyboard and mouse or a PS/2 or PC keyboard and mouse. The PC/Mac2000 incorporates specially written hybrid software that translates between the different keyboards allowing you to use a PC or a Mac style keyboard and mouse devices. The switching between computers is done by pressing on a front panel toggle switch, or by using the "F11" function key from the keyboard. The toggling between computers is configured for the number of computers connected to the system.

The ex•tend•it PC/Mac 2000 hardware is modular. Each computer connects to its own input card.The hardware is pre-configured as desired with no restriction to the order in which input cards are placed.The four dip swithes on the front of the unit select the different modes and keyboards used in the unit.

The ex•tend•it PC/Mac2000 supports all PC compatible mouse and keyboard devices. The monitors must be multisync type, in any size or resolution that is supported by the computer.

OPERATION NOTES

READ THESE NOTES BEFORE INSTALLING OR OPERATING THE PC/MAC2000 SYSTEM.

WARNING!: The PC/Mac2000 is designed to operate on any IBM PC compatible, SGI and/or Macintosh computer. Do not attempt to use this equipment with any other type computers.

1. Power down your computers before connecting to the PC/ Mac2000 input cards.

2. PC/Mac2000 Switcher Unit
   Power up the PC/Mac 2000 first. Connect your Multisync Monitor, ADB or PS/2 cables to the input cards of the PC/ Mac2000 switcher.

3. Computers Connection
   Connect the supplied extension cables to the CPU1 through CPU6 input cards on the PC/Mac2000 switcher. For PC or SGI extension connect the PS/2 keyboard and PS/2 mouse cables. For the Macintosh connect the ADB cable. The Video is the same for both PC and Mac type computers. Older Macintosh computers will need to add the an adpater from 15pinD sub to 15pin HD connection.

4. Setting Dip Switch Configuration
   Dipswitch Settings are configured for your application. Please refer to page 13.

CABLE CONNECTION AND POWERUP SEQUENCE

Each input card supports the connection for Macintosh ADB, PS/2 keyboard and PS/2 mouse cable. Serial mouse and AT keyboards are connected thurough the PS/2 connectors using "off the shelf" adapters. The monitor connects to the 15HD connector using the supplied extension cables. (In addition, for Macintosh computers, also use the "ViewSonic" adapter to select the best resolution before the power is turned on.

1) Connect the cable extension from the computer to the 15HD monitor connector and keyboard/mouse on the input card using the supplied cables.

2) Connect the monitor output to a multi sync compatible monitor. A multi sync monitor is prefered, but any VGA or XVGA monitor will work as well.

3) Connect the keyboard and mouse to the ADB, PS/2 or Serial output.

6) Power up the PC/Mac 2000 unit.

7) Power up each computer starting from the computer that is attached to input card no. 1, wait till it finishes the start up sequence. Power up all the other connected computers as described above. (Wait till each computer is fully operational before switching to another computer)

8) Switch between the computers to verify that all the connected computers show an active monitor display and keyboard/mouse activity.

PC/MAC 2000 OPERATION NOTES

1) The EXTENDIT PC/Mac 2000 CPU switching is done electronically. The PC/Mac must have the power ON first, and it needs to stay with the power ON at all times in order for the hardware to perform correctly.

2) If you must reboot the PC or Mac computer again, you can do so without interfering with the other connected computers.

3) The PC/Mac 2000 share the same monitor between the PC and MAC computers. The PC/Mac 2000 monitor output needs to be compatible with multi sync monitor types.

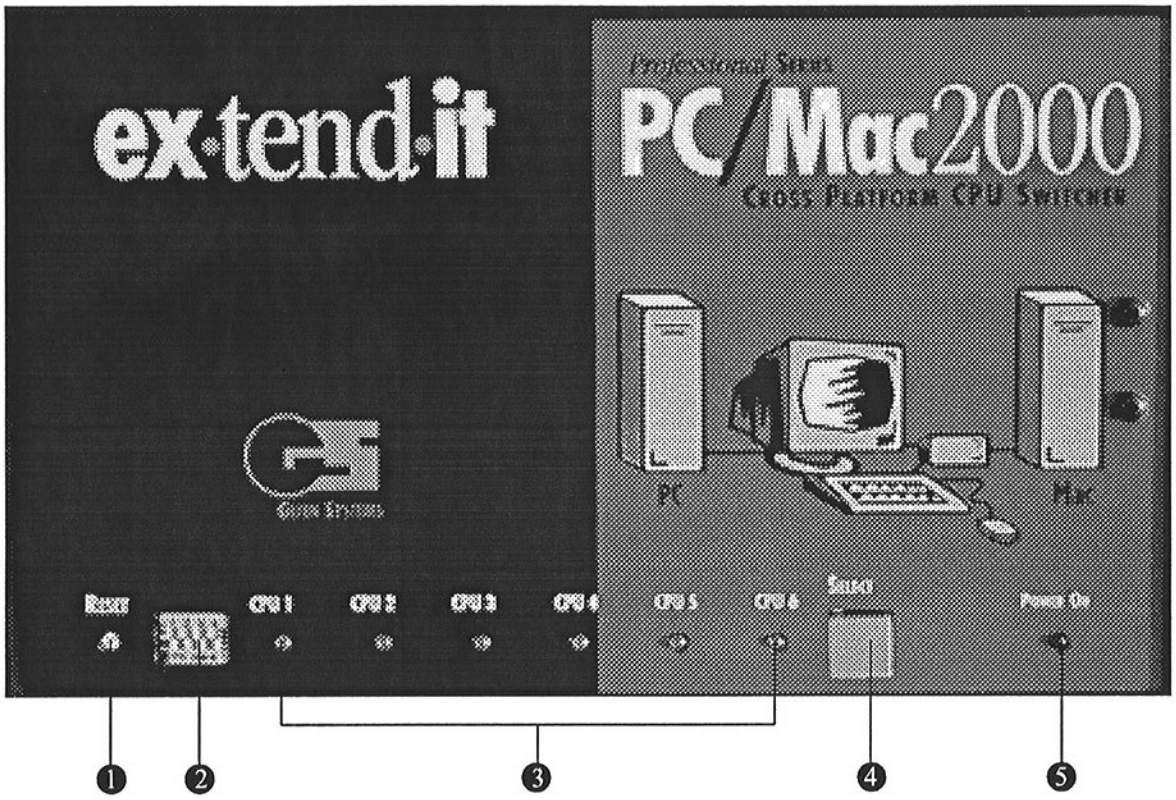
5) The PC/MAC 2000 supports all the functions of the PC computer, however F12 (function key 12) is reserved to support "right click" of PC mouse functionallity.

6) The Macintosh ADB keyboard and mouse functions are fully supported.

7) Six Macintosh or PC computers can be connected to the PC/Mac 2000 CPU switcher. Each input card can be configured to a PC or a MAC operation

8) F11 (function key) is used to switch between computers.

PC/MAC 2000 FRONT PANEL



Front Panel Function Descriptions

❶ **Reset Button**
This button should be pushed whenever there is a change with any DIP Configuration; input card, front panel or motherboard.

❷ **DIP Configuration, Front Panel**
These four dip switches set up the PC/MAC 2000 keyboard/mouse, Remote and Master/Slave configuration as follows:

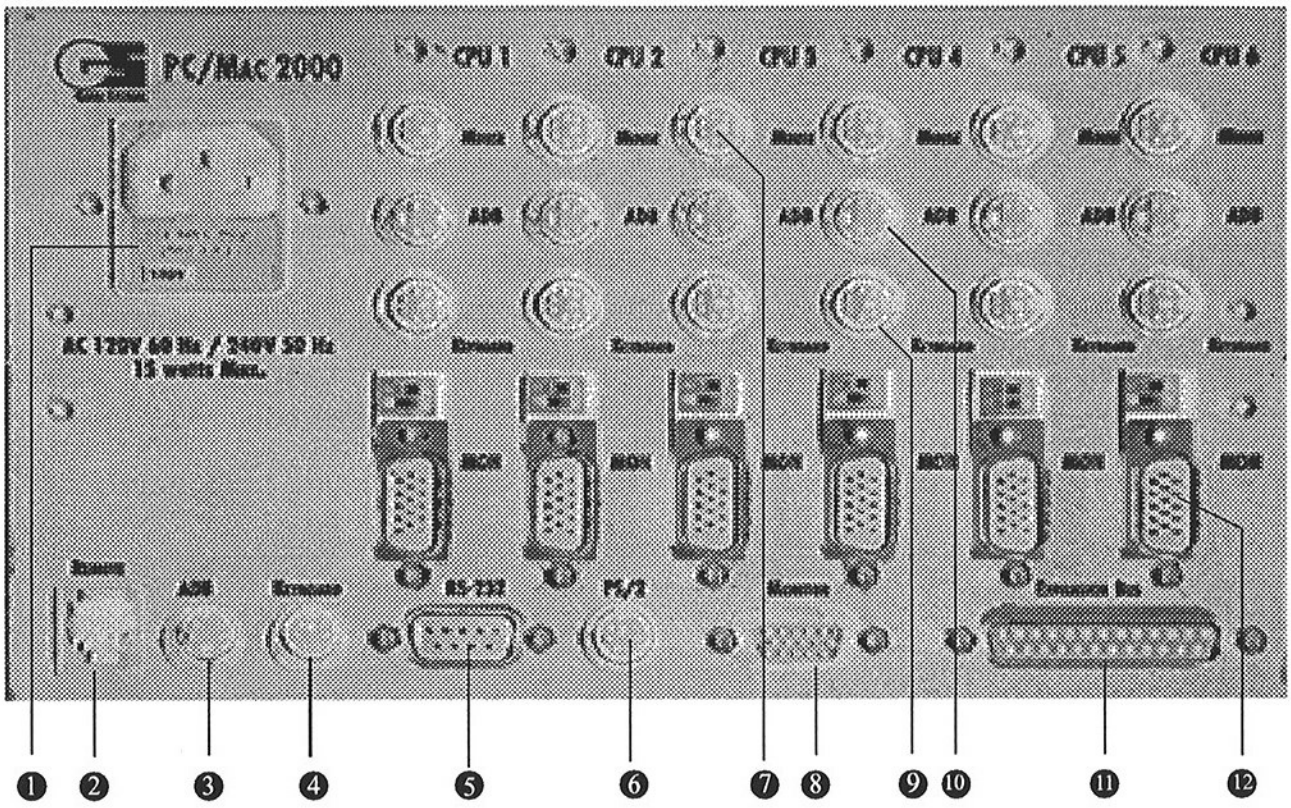
SW#1 Up SW#2 Up - PC Keyboard, PS/2 Mouse
SW#1 Down SW#2 Up - PC Keyboard, SERIAL Mouse
SW#1 Down SW#2 Down - Mac Keyboard, ADB Mouse
SW#3 Down - Master or Single unit use
SW#3 Up - Slave to another unit
SW#4 Down - Local Control
SW#4 Up - Remote Control

❸ **CPU 1—CPU 6**
These LED indicators give graphic representation as to which CPU is being controled by the keyboard/ mouse and monitor combination.

❹ **Select Switch**
This switch cycles through the sequence of controlled CPUs beginning at 1 and ending with the number of units controled as set by the DIP switch.

❺ **Power Indicator**
This LED indicates a positive or negative AC Power status.
Insert boards while this status equals OFF.
DIP Switches can be changed while status is ON but the Reset Switch will need to be momentarily engaged.

PC/MAC 2000 BACK PANEL



BACK PANEL FUNCTION DESCRIPTIONS

❶ **AC Input / Voltage Select Switch**
Selector switch for 110-120 volts AC 60Hz or 220-240 Volts AC 50Hz.

❷ **Remote**
RJ-11 Modular Jack 6 connector which interfaces to a RMT16 remote unit.

❸ **ADB Keyboard Output**
Connection to ADB keyboard and mouse.

❹ **PS/2 Keyboard Output**
Mini DIN sub connector which connects to a PS/2 style PC keyboard.

❺ **RS232 Mouse Output**
9 pin D sub connector for Serial-style PC mouse.

❻ **PS/2 Mouse Output**
Mini din sub connector which connects to aPS/2 style PC mouse.

❼ **PS/2 mouse Input**
Mini din sub connector which connects to a PS/2 style PC mouse.

❽ **Video Output**
HD-15 Male connector which connects to your monitor.

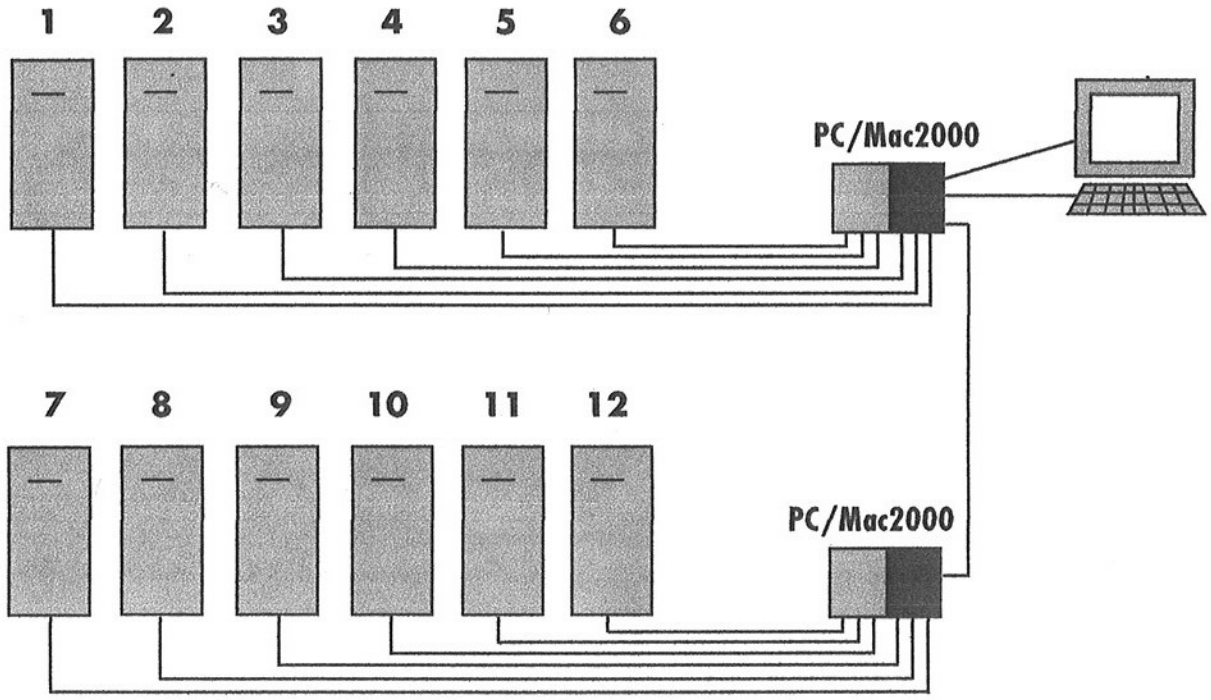
❾ **PS/2 Keyboard Input**
Mini DIN sub connector which connects to a PS/2 style PC keyboard.

❿ **ADB Keyboard and Mouse Input**
Connection to ADB keyboard and mouse.

⓫ **Expansion Bus**
DB-25 female connector. A cable interfaces to a second PC/Mac2000 unit.

⓬ **Video Inputs**
HD-15 Male connector which connects to each computer monitor port.

TYPICAL WIRING DIAGRAM



DIP SWITCH SET-UPS

DIP switches are used in three places on the PC/Mac2000:

1) On the motherboard to set the number of computers handled,

2) On the input card to designate which style of keyboard and mouse are being input to the card and

3) On the front panel to indicate which style of keyboard is active on the output, plus whether the unit is a slave to another PC/Mac2000 (or the master) and whether the unit is being controlled by the remote switch.

1) The Front Panel DIP Switch is described on Page 10 of this manual.

2) The Input Card DIP Switch is as follows:

Switch #1 Up (Off)—Serial Mouse
Switch #1 Dn (On)—PS2 Mouse
Switch #2 Up (Off)—Mac Keyboard
Switch #2 Dn (On)—PC Keyboard

The Motherboard DIP Switch represents a binary count of the number of units controlled by the PC/Mac2000 or a series of PC/Mac2000s. Because Gefen Systems follows a protocol designating binary 0 as being the first computer, confusion may enter here. Binary 15 equals 16 computers!

In the following chart we count up to 4 bits binary 1111 (with 5 bits shown) /decimal 15/computer 16. If you are controlling more than 16 computers, our bet is that you know how to count higher. Either way, call if you need help.

Binary	Decimal	Computer #	Up/Down
00000	0	1	UUUUU
00001	1	2	UUUUD
00010	2	3	UUUDU
00011	3	4	UUUDD
00100	4	5	UUDUU
00101	5	6	UUDUD
00110	6	7	UUDDU
00111	7	8	UUDDD
01000	8	9	UDUUU
01001	9	10	UDUUD
01010	10	11	UDUDU
01011	11	12	UDUDD
01100	12	13	UDDUU
01101	13	14	UDDUD
01110	14	15	UDDDU
01111	15	16	UDDDD

SPECIFICATIONS

Video Amplifier Bandwidth	350 MHz
Actual Bandwidth	120 MHz
Input Video Signal	1.2 volts p-p
Input Sync Signal	5 volts p-p (TTL)
Horizontal Frequency Range	15-100 KHz
Vertical Frequency Range	30 - 170 Hz
Video Connector	DB-15HD
RGB Output Gain	+1 dB Gain
Link Connector	RJ-45 Teleco
Keyboard Connectors	ADB,PS/2 or AT
Mouse Connectors	ADB, PS/2 or Serial
Power Consumption	15 Watts (max.)
Power Supply	100-240 volts
Dimensions	3.2"H x 8.4"W x 6"D
Rack Mountable	3 Rack spaces
Shipping Weight	8 lbs. (3.6 kg)

CONNECTOR PINOUTS

The illustrations below show the connectors as seen from the PXC150 unit or looking directly into the connector. The pin numbers and signals are standard.

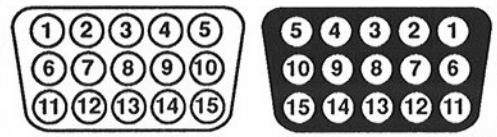
AT KEYBOARD

PIN #	SIGNAL	PIN#	SIGNAL
1	Clock	4	Ground
2	Data	5	+5 v
3	NC		

PS/2 KEYBOARD / MOUSE

PIN #	SIGNAL	PIN#	SIGNAL
1	Data	4	+5 v
2	NC	5	Clock
3	Ground	6	NC

VGA VIDEO

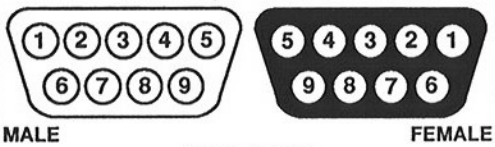


PIN #	SIGNAL	PIN#	SIGNAL
1	Red	9	N/C
2	Green	10	GND
3	Blue	11	ID0
4	ID2	12	ID1
5	GND Test	13	Horiz Sync
6	RED GND	14	Vertical Sync
7	GRN GND	15	ID3
8	Blue GND		

MAC KEYBOARD

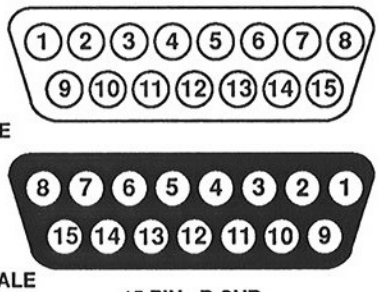
PIN #	SIGNAL	PIN#	SIGNAL
1	Data	3	+5 v
2	Pwr Up	4	Ground

SERIAL MOUSE



PIN #	SIGNAL	PIN#	SIGNAL
1	N/C	6	N/C
2	RX	7	RTS
3	TX	8	N/C
4	DTR	9	N/C
5			

MAC VIDEO



PIN #	SIGNAL	PIN#	SIGNAL
1	Red Grnd	9	Blue Video
2	Red Video	10	Sense 2
3	Comp. Sync	11	Ground
4	Sense 0	12	Vert. Sync
5	Green Video	13	Blue Grnd
6	Red Grnd	14	Grnd
7	Sense 1	15	Horz. Sync
8	N/C		

TROUBLE SHOOTING

Overview

The PC/Mac2000 is a crossplatform switcher designed to allow users to work on their PC's using either a Macintosh or PC compatible keyboard and mouse. The switcher is placed in close proximity to the monitor and keyboards and it connects directly to the participating CPU's with straight cables.

The basic configuration PC/Mac2000 CPU Switcher is for two CPU's typically a Macintosh and a PC or any combination of two computers PCs or Macs with expansion capability of up to six computers for each PC/mac2000 switcher.

Two PC/Mac2000 CPU switchers can be connected together creating the ability to switch between up to twelve (12) CPUs. In addition Two PC/Mac2000 CPU Switchers can be connected in a "Master-Slave" configuration, allowing synchronized switching of two monitors side by side from six different computers.

The PC/Mac2000 unit can be switched online from the keyboard (using F11) or by a push button on the front of the unit itself. A separate remote control unit the RMT-16 with a digital numeric display is available as an accessory. Also as an accessory is a contact closure box for remote control from a console switching

The Connections

The PC/Mac2000 input cards are designed to offer maximum flexibility in a modular system, which allows different computer types to be connected in the back of the unit. The input cards include their own microprocessor unit to control and communicate with the connected computer, (including mouse/keyboard and monitor setting). The cable connection is simple and intuitive for both ADB (keyboard and mouse) and PS/2 (keyboard and mouse). The serial mouse uses an adapter from DB9 to PS/2. The video cable is a15pin HD type (SVGA) connection.

The Dipswitches

There are four (4) total dipswitches involved in a PC/Mac2000 system. The input card has a dipswich setting with a number setting corresponding to a numeric address number (see the diagram of the switches in the manual). It is used to tell the host PC/Mac2000 unit which input card is corresponding to computer #1, 2, 3,4 etc.... A second dipswitch has two switches. The setting is:
For Macintosh (Off, Off)
For PS/2 (On.On)
For serial mouse (Off, ON)
For input card inactive (On/Off.

The motherboard has two dipswitches. One inside the motherboard which is set at the factory and is used to set the maximum number of input cards included in each PC/Mac2000 switcher (i.e. 1-6).

TROUBLE SHOOTING

The setting of the four position dip switch in the front panel:

Dipswitch#1- OFF is used for ADB keyboard/mouse
Dipswitch#1- ON is used for PC
Dipswitch#2- ON is used for PS/2 mouse
Dipswitch#2- OFF is used for Serial mouse
Dipswitch#3- ON Master/slave setting for Master
Dipswitch#4- OFF is used for keyboard switching (F11 function key)
Dipswitch#4- ON is used for remote control (RMT-16)
The Reset button always reset your CPU switcher (at position 1).

Troubleshooting guide:

Troubleshooting notes:
• Apply the Power ON to the PC/Mac2000 CPU switcher before attempting to startup the connected computers.

• Leave the Power ON for the PC/Mac2000 at all times.

• F11 (function key) is used to switch from the keyboard between computers. You can always use F11 regardless of the status of the computer being pointed to (i.e. you can use F11 while re-booting)

• F12 (function key) is used as the startup button for the Macintosh computers when using a PC keyboard.

• Startup each computer while it is switched (pointed) to that computer switch position. This will ensure proper monitor size setting as well as verification if the computer keyboard and mouse are active.

• F12 (function key) is used as the "right click" function of any PC mouse when using the ADB Macintosh keyboard as the default keyboard/mouse.

• If you are using F11 and F12 function keys for something else in your programming, hold the Switch button and press the Reset button to set the CPU switcher without F11 and F12 (function keys)

• Make sure to connect a monitor, keyboard and mouse to the output of the PC/Mac2000 before attempting to switch between computers. Failing to connect the monitor, keyboard and mouse may cause a "freeze" of the screen and mouse.

TROUBLE SHOOTING

• Verify that all interconnecting cables are secured and plugged in.

• Press the Reset button whenever the switching get stuck.

Troubleshooting pointers begin on next page.
Troubleshooting pointers

1- The default setting for the output keyboard/mouse (all switches off) is for using the Macintosh ADB keyboard/mouse. If you want to use the PC keyboard and PS/2 mouse as the default, you will need to setup the dipswitches for the PC keyboard and PS/2 mouse (see manual for dipswitch description)

2- If there is no monitor (display) present, verify that the monitor cable is secured at the input card. Or press the Reset button and try again.

3- If there is no monitor (display) present, and you are using a MAC to VGA adapter for the Macintosh, make sure the adapter dipswitches are setup correctly.

4- If there is no mouse movement verify that the input card dip switch (in back) are set correctly for the type of computer used in that input card. Push the Reset button to try again. Also verify that the output mouse is setup for the type of mouse used.

5- If there is no keyboard movement, verify that the input card dip switch (in back) is set correctly for the type of computer used in that input card. Push the Reset button to try again. Also verify that the output keyboard is setup for the type of keyboard used.

6- If you are using the RMT-16 remote control, the keyboard switching using (F11) is inactive.

7- If you are using two (2) PC/Mac 2000 CPU switchers to switch more than six (6) computers, you must use the expansion cables between the two PC/Mac2000. The expansion cables are ordered separately.

8- The push button in the front panel advances forward only. If you are using CPU#1 and want to go to CPU#6, it will require five additional push button presses.

9- You can switch between using a PC keyboard/mouse and Macintosh ADB keyboard/mouse online, without fear of your computer freezing or affecting other CPUs attached to the input cards.

WARRANTY

Gefen Inc. warrants the equipment it manufactures to be free from defects in material and workmanship.

If equipment fails because of such defects and Gefen Inc. is notified within one (1) year from the date of shipment, Gefen Systems will, at its option, repair or replace the equipment, provided that the equipment has not been subjected to mechanical, electrical, or other abuse or modifications.

Equipment that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the of repair. Such repairs are warranted for ninety (90) days from the day of reshipment to the Buyer.

This warranty is in lieu of all other warranties expressed or implied, including without limitation, any implied warranty or merchantability or fitness for any particular purpose, all of which are expressly disclaimed.

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